

**ASSESSMENT AND EXAMINATIONS DIRECTORATE**

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## **NSC 2015 CHIEF MARKER'S REPORT**

<b>SUBJECT</b>	Mathematical Literacy
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<b>PAPER</b>	2
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<b>DATE OF EXAMINATION:</b>	02 November 2015	<b>DURATION:</b>	<b>3 HOURS</b>
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This section of the instrument is aimed at providing valuable feedback to schools, subject advisors, teachers and learners about common errors committed by candidates in the answering of questions, to assist teachers and subject advisors to identify areas that need to be given special attention in the teaching and learning of the subject in 2016.

Your responses will be based on two parts:

**Section 1:** General overview of Learner performance in the question paper as a whole

**Section 2:** Comment on candidates' performance on individual questions (Detailed explanations must be provided **per question** as follows: (You may include sub questions where necessary))

- General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?
- Why the question was poorly answered?
- Provide suggestion for improvement in relation to teaching and learning
- Describe any other specific observations relating to responses of learners
- Any other comments useful to teachers, subject advisors, teacher development

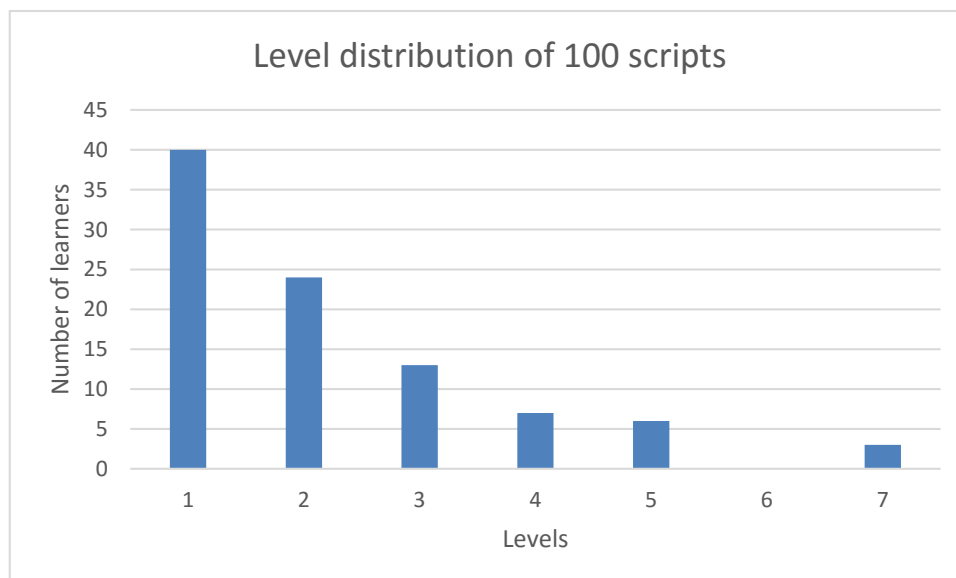
## SECTION 1: (General overview of Learner Performance in the question paper as a whole)

Generally this question paper was answered very poorly by most of the learners. First of all it was a great challenge for learners to absorb and comprehend the enormous information that was given to them in most of the questions. It seems like learners did not know what was expected from them. As we are dealing with learners where their mother tongue language is not the language of the question paper, they really battled to master the answering of the questions.

Some of the questions referred to reasoning and reflecting and learners could not express themselves in an appropriate way. To verify some of the statements, learners had to base their verification on calculations, but they either gave their opinion only or left out the calculations and vice versa. Although definitions were given, it still did not help the learners to solve the problems. Most of them rewrite the definitions from the questions paper without any interpretation of it.

The high level questions were really out of the league of the average and below average learner.

I can conclude by saying that the paper was not a user friendly paper, therefore it was not marking friendly at all. The marking was difficult due to the many CA's in some of the questions. From the 100 scripts the following graph explains how difficult the questions paper was for the learners.



From the analysis the highest mark is 133 and the lowest 0 for this paper. The analysis is as follow: Question 1 – average mark 15,4 (45,29%), Question 2 – average mark 12,2 (40,73%), Question 3 – average mark 5,82 (18,77%), Question 4 – average mark 8,77 (28,29%), Question 5 – average mark 5,98 (24,88%). Therefore the worst answered Questions were question 3, 4 and 5. The average mark for the 100 scripts is 48,18 (32,12%).

## SECTION 2: Comment on candidates' performance in individual questions

(It is expected that a comment will be provided for each question on a separate sheet).

### QUESTION 1

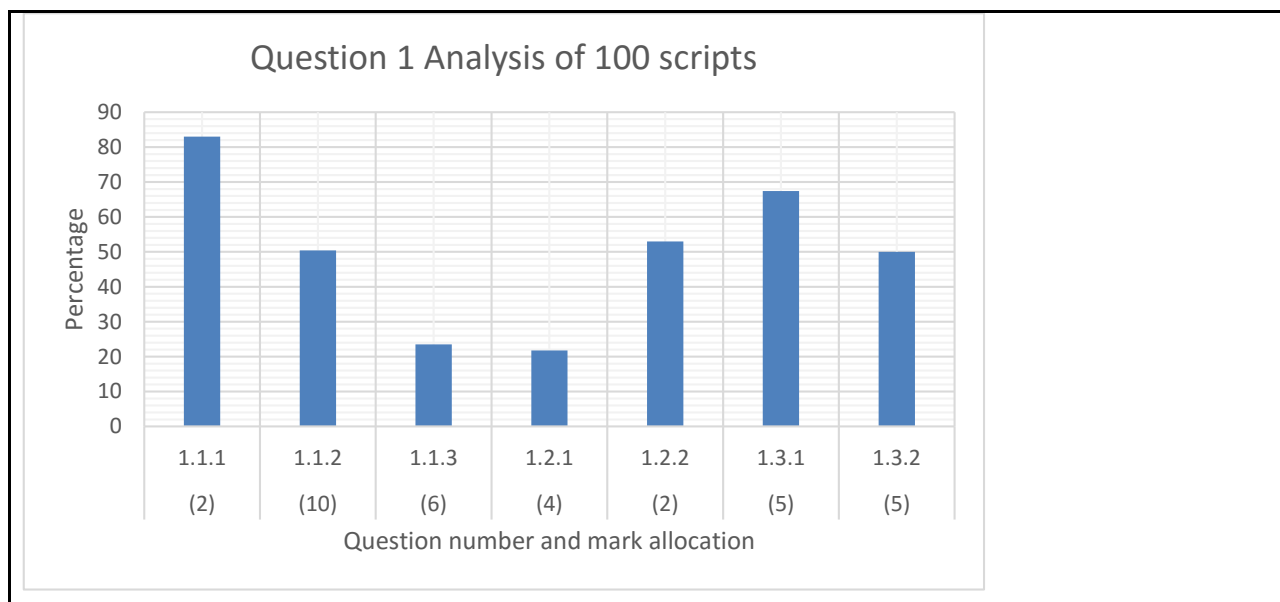
(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

In Question 1 the key information was almost  $\frac{1}{2}$  of the page which was quite a challenge for the learners for an opening question.

Details to follow in Section 2. From the 100 scripts sample it is evident that the average mark for this question was only 15.4 out of a possible 34 marks, while only 1 learner managed to score 32 marks.

In this Question, learners had difficulties to absorb all the information and to make sense out of it before answering the question. Within the attached analysis it can be seen that most of the learners could not manage to score full marks in this Question.

QUESTION 1						
1.1			1.2		1.3	
1.1.1	1.1.2	1.1.3	1.2.1	1.2.2	1.3.1	1.3.2
(2)	(10)	(6)	(4)	(2)	(5)	(5)
166	504	141	87	106	337	250
100	100	100	100	100	100	100
1.66	5.04	1.41	0.87	1.06	3.37	2.5
83	50.4	23.5	21.8	53	67.4	50



(a) Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

#### 1.1 Unemployment Insurance Fund (UIF)

- 1.1.1 Most of the learners managed to score full marks. Those who did not, just used values to add and subtract to get to the given value in the question.
- 1.1.2 Most of the learners only work out 1% for UIF although the information refers to “employer and employee each contribute 1%”. The way the question was phrased could have been misleading to the learners “UIF for all the additional employees”. The last part of the question should have been omitted, because that mislead the learners to use only 1% or it could have been rephrased as “Calculate how much is paid in total to the UIF.” Some of the learners only work with one worker’s salary instead of multiplying by the number of workers.
- 1.1.3 This question was loaded, finding percentage difference between the mean salary of all workers and the lowest paid employee. This was a high order question for our learners which included to different calculations to find a percentage difference. Most of them could not figure out what they had to do. Some of them used the salaries of the four different types of workers to find the mean. There after they use the same salaries to find the lowest paid worker. It could be seen that they did not understand what they had to do.

#### 1.2 Employee of the month

- 1.2.1 Learners could not work out the probability using the ratio 1:3 to determine how many women work in the company. Instead of using 1/4 they use



They also did not follow the instruction “round off to three decimal places”.  
They did not know they have to find the total number of workers in the company.

- 1.2.2 Most of the learners could answer the question whether using calculations or an explanation.

### 1.3 Income replacement benefits

- 1.3.1 Learners could easily manage to calculate the value of A, but struggled to calculate the value of B. For the value of B, they used the correct IRR, but without the percentage (divided by 41,31 instead of 41,31%).

- 1.3.2 While some learners managed to draw the graph perfectly, others struggled to plot the points correctly because they lack the knowledge of decimal values as well as the plotting of these decimal values on graph paper.

#### (b) Provide suggestions for improvement in relation to Teaching and Learning

- These kind of analysis must be incorporated in teaching.
- Teach learners how to take separate the information in order to focus on conceptual understanding.
- Give learners extended opportunities to draw graphs which involves decimal values.
- Teachers should emphasize the importance of work dealt with in Grade 10 and 11 such as ratios, percentages, etc.
- Use a variety of text books in order to expose the learners to a wide range of these types of questions and the various ways in which the questions can be posed.
- Incorporate Grade 10 and 11 work as part of teaching Grade 12 syllabus

#### (c) Provide suggestions for improvement in relation to Teaching and Learning

- These kind of analysis must be incorporated in teaching.
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- Teachers should emphasize the importance of work dealt with in Grade 10 and 11 such as ratios, percentages, etc.
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- Incorporate Grade 10 and 11 work as part of teaching Grade 12 syllabus

(d) Describe any other specific observations relating to responses of learners

- The challenge to most learners was the fact that they had to absorb and comprehend so much information. Not only did our second language learners suffer, but also our home language learners.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Expose learners to more scenarios with loaded information so that they can get used to it.
- Provide more intensive support and training to our educators, especially where the learners results are of great concern.
- Exchange teaching methods in order to make teaching more interesting to the learners.
- As Mathematical Literacy is becoming a critical subject, teachers should be trained.

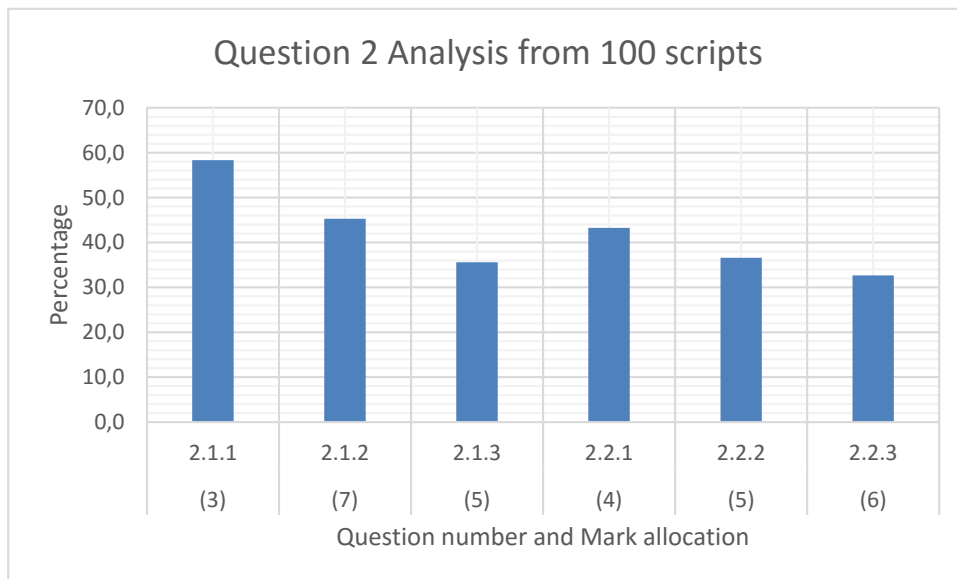
## QUESTION 2

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

Learners also find difficulty with this question. The challenge with question 2 was that 1 of the annexures was attached at the back of the questions paper which could have been very time consuming for learners to page backwards and forward. From the 100 script analysis, the average mark for this question is 12,22 marks out of 30 marks.



QUESTION 2					
2.1			2.2		
2.1.1	2.1.2	2.1.3	2.2.1	2.2.2	2.2.3
<b>(3)</b>	<b>(7)</b>	<b>(5)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>
<b>175</b>	317	178	173	183	196
100	100	100	100	100	100
1.75	3.17	1.78	1.73	1.83	1.96
58.3	45.3	35.6	43.3	36.6	32.7



(b) Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

2.1.1 Learners interpreted the question incorrectly although it was stated “selecting a South African”, they used both data sets.

2.1.2 The question referred to both USA and SA, but learners still only used either the USA data or the SA data. They have also omitted to calculate the missing values for the USA males. And if converted, they divided with the given conversion instead of multiplying. There is still learners that enter all values into the calculator than end up with an incorrect answer as their calculators are programmed to follow the BODMAS rule.

2.1.3 Instead of calculating the IQR, learners calculated the range for males and females. Learners also make the mistake of subtracting the highest value from the lowest and end up having a negative number.

2.2.1 Although a conversion table was given learners struggle to convert teaspoons to grams.

It was also quite shocking to see learners do not know how many days there are



in one year. Learners were not disadvantaged by using 366 days for a leap year.

2.2.2 Learners could easily calculate the calories before, but then struggle with the Calculation after. They could not work with the ratio where they had to convert 500 ml to the given volume of 240 ml.

2.2.3 This question was poorly answered by most learners. As they had to verify the statement of before and after, they only gave one solution and find 50 % of that instead of doing both calculations and find a percentage of that.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- Practice different conversion tables with learners.
- Educators to use different scenarios of unfamiliar contexts.
- Teach learners the difference between range and inter quartile range through using more box and whisker plots.
- Improve learners' skills on reading with comprehension.
- Emphasize the importance of giving detailed information.
- Give extended opportunities to work with median.
- Teach learners how to work with ratios in different context.
- Learners should be taught to verify statement with calculations.
- Constantly remind learners to refrain from giving answers only.

(d) Describe any other specific observations relating to responses of learners

- When calculating percentages, learners did not multiply by 100.
- Instead of calculating the IQR, they calculated the range of the given data.
- Learners did not know how many days in one year.
- Learners lose valuable marks by giving vague responses.
- Learners confuse the mean with median.
- Learners cannot work with ratios from one value to another.
- Learners are still giving answers only, although the instructions indicates that you have to show all calculations. This can be to their disadvantage if the answer is incorrect, because marks are awarded for the different methods.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Workshops must be conducted at beginning of each term to strengthen their weaknesses.
- If teachers have problems in teaching certain topics, subject advisors should





intervene and support.

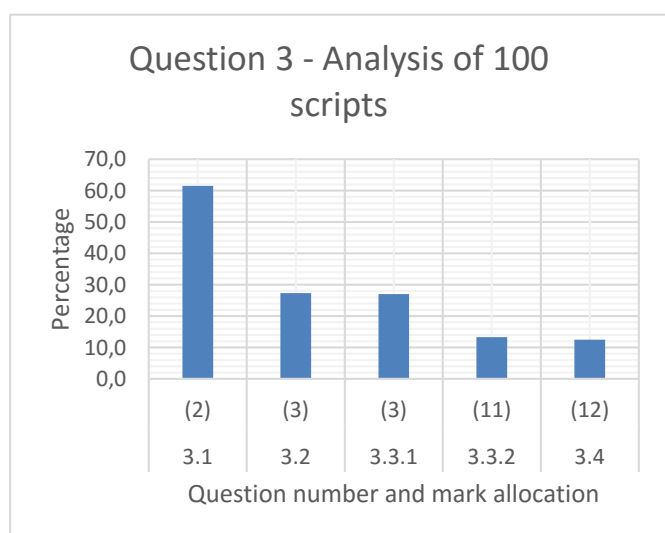
- Other teachers can also give input in how they teach a specific section in order for learners to understand.
- Visits by subject advisors to schools on a regular basis is crucial and not only when the need arises.

### QUESTION 3

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

This question was the worst answered of all the questions. Measurement remains a challenging topic to most of educators and learners. Learners find it difficult make sense of the given plan especially when referred to exterior and interior wall. It could have been made easier if the words “walls on the outside and walls on the inside” were used. From the 100 script analysis, the average mark for this question is 5,82 marks out of 31 marks.

3.1	3.2	3.3.1	3.3.2	3.4
<b>(2)</b>	<b>(3)</b>	<b>(3)</b>	<b>(11)</b>	<b>(12)</b>
123	82	81	146	150
100	100	100	100	100
1.23	0.82	0.81	1.46	1.5
61.5	27.3	27.0	13.3	12.5



(b) Why the question was poorly answered? Also provide specific examples, indicate

common errors committed by learners in this question, and any misconceptions.



- 3.1 This question was well answered. But due to the language barrier learners could not express themselves very well.
- 3.2 Although the key information states that the northern side is exposed to the sun, learners couldn't manage to figure out that the southern side is cooler.
- 3.3.1 Learners could not find the dimensions of the interior wall where the exterior wall was given in the plan. Most of them only manage to find the % without subtracting it. Others first find the area and then worked out 7,04% of the area.
- 3.3.2 To most of the learners this question was extremely difficult, because they had to find the areas of all the walls without the door openings, passage and window. They also didn't use the dimensions of the interior walls, but the dimensions of the exterior walls. Some of them could not see there were two door with the same dimensions as well as used the dimension of another window which does not match that of the living room. Learners still struggle to do conversions between measurements.
- 3.4 A very small % of learners managed to find the surface area of one panel, but 99,9% of them could not find the number of panels needed. To get the volume learners multiply with different units. Learners still find it difficult work with VAT, don't know what VAT included and VAT excluded mean.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- When working with house plans, mention the importance of direction in which the house is facing.
- More revision on conversion between different units.
- Emphasize the fact that learners cannot work with different units when adding, subtracting, multiplying and dividing.
- Emphasize working with the same units when solving problems.
- Calculator skills must be instilled, especially looking at the MODE of the calculator.
- More revision on the topic of Measurement must be done.
- When giving scenarios that are complex in the classroom, guide learners on how to do a step by step solution especially in how to read and comprehend.
- Teacher need to make this topic as practical as possible in order for learners to visualize.
- More question on critical thinking should be given to expose learners to these type of questions on a regular basis.



(d) Describe any other specific observations relating to responses of learners

- Most of the learners did not attempt to do question 3.3 and 3.4.
- Learners gave answers in scientific notation.
- Learners measured the dimensions of the plan which was necessary because no scale was given.
- Learners cannot differentiate between area, surface area and volume.
- The writing down of units in their final answers is crucial, because they don't know the difference between 2-dimensional and 3-dimensional.

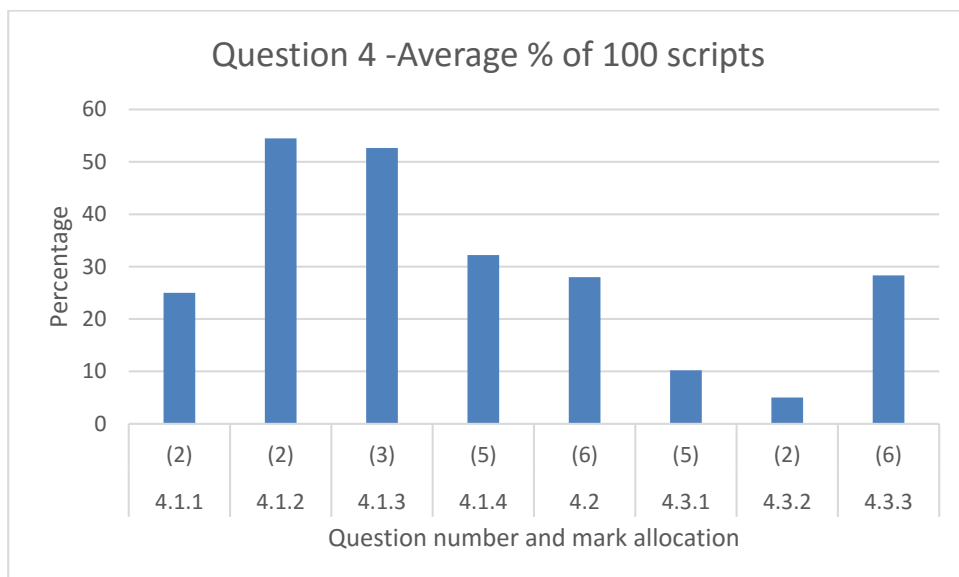
(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- The training of teachers especially in this Topic of Measurement is essential.
- Subject advisors need to conduct workshops on Measurement where experts teachers can assist in the training of the teachers.
- Appoint qualified Subject advisors for Mathematical Literacy as this is a totally different subject from Mathematics and the current subject advisors give more attention to Mathematics.

#### QUESTION 4

(a) General comment on the performance of learners in the specific question. Was the question well answered or poorly answered?

4.1.1	4.1.2	4.1.3	4.1.4	4.2	4.3.1	4.3.2	4.3.3
<b>(2)</b>	<b>(2)</b>	<b>(3)</b>	<b>(5)</b>	<b>(6)</b>	<b>(5)</b>	<b>(2)</b>	<b>(6)</b>
<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>0,5</b>	<b>1,09</b>	<b>1,58</b>	<b>1,61</b>	<b>1,68</b>	<b>0,51</b>	<b>0,1</b>	<b>1,7</b>
25	54.5	52.7	32.2	28	10.2	5	28.3



As seen from the above, most of the questions were poorly answered with the worst questions 4.3.1 and 4.3.2. Too much information was given which made it difficult for learners to comprehend. What made it even worse is the fact that some of the information was unnecessary because none of them was referred to in the answering of the questions. For example the key information states what the learner will be studying, but the annexure included three other fields of studying that is not related to any questions in this section. The learner was actually mislead by the unnecessary adding of information. The same happened In 4.3 where some information was not needed at all. Too much information confuse the learners.

(b) Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

- 4.1.1 Learners did not know why course fees are given as a scale.
- 4.1.2 Most of the learners could relate to the why a double room cost less than a single room.
- 4.1.3 This question was well answered with a few exceptions. With calculating the total cost for tuition and accommodation, they omitted the additional R 2 000 that she has to pay for not being a South African citizen. Or learners only added all the scales or they used any values to add in order to get a total. They didn't understand the meaning of minimum tuition fees.
- 4.1.4 Learners couldn't find the 30% of the tuition fees as well as the monthly residence fee. They just added the tuition fees(without 30%), deposit and the residence fees for the, while the question asks for a month (eleven equal payment).



- 4.2 Some learners managed to divide the Life Orientation percentage by 2, but couldn't round to the nearest 10%. Some used all the subjects while the instruction was to only use the six best subjects.
- 4.3.1 Learners only used the distance from Windhoek to Pretoria and then find the time. Most of them didn't have a clue how to work with a strip chart. If they have considered the distance to Gaborone, they didn't use a return distance.
- 4.3.2 Most of the learners could not answer this question. Only said the one line is shorter than the other or the strip chart is drawn incorrectly, because if the distances are the same, then the lines must be the same.
- 4.3.3 Learners could add all the Pulas but forget to multiply the 680 pula for accommodation by 3. Learners struggle to work with exchange rates. They don't know when to multiply and when to divide.

- (c) Provide suggestions for improvement in relation to Teaching and Learning
- Teach different context that involve scales such as water, electricity, parking, etc.
  - Seeing that MLIT is relevant to real life, it could help to take learners on Educational tours.
  - More strip charts must be used and explained to learners.
  - Make use of other resources such as Automobile Association (AA) to make it more interesting for the learners.
  - Use prospectus from different universities.
  - Expose learners to newspapers to learn about exchange rates and encourage them to be clued up with the strength and weakness of their own currencies.

- (d) Describe any other specific observations relating to responses of learners
- Learners attempt to do the questions but were clueless most of the time.
  - Learners must learn to read information before they answer questions.
  - Learners does not use given information to solve their problems such as minimum monthly payment for 11 months.
  - They experience great challenges with strip charts.
  - Language problems and the lack of exposure to a large variety of data is becoming very apparent.
  - Learners are unable to read the questions with comprehension and don't have the ability to express themselves.

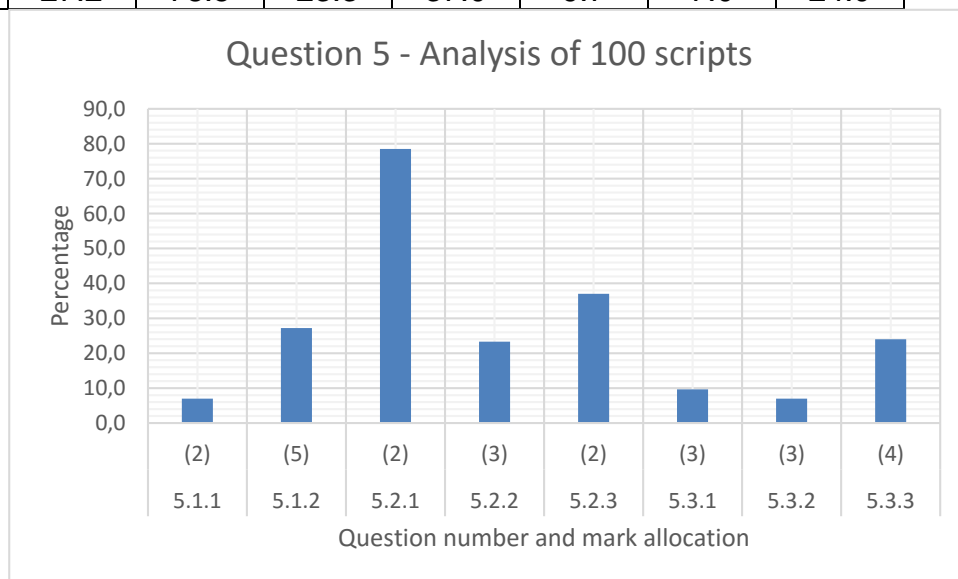


- (e) Any other comments useful to teachers, subject advisors, teacher development etc.
- Subject advisors must provide teachers with more intensive training.
  - Subject advisors must give support as there is a great lack of knowledge with teachers which comes through in the learners work as in the marking of questions.
  - Teachers must taught how to use their CAPS document.

#### QUESTION 5

- (a) General comment on the performance of learners in the specific question.  
Was the question well answered or poorly answered?

5.1.1	5.1.2	5.2.1	5.2.2	5.2.3	5.3.1	5.3.2	5.3.3
<b>(2)</b>	<b>(5)</b>	<b>(2)</b>	<b>(3)</b>	<b>(2)</b>	<b>(3)</b>	<b>(3)</b>	<b>(4)</b>
<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>0,14</b>	<b>1,36</b>	<b>1,57</b>	<b>0,7</b>	<b>0,74</b>	<b>0,29</b>	<b>0,21</b>	<b>0,96</b>
7.0	27.2	78.5	23.3	37.0	9.7	7.0	24.0



Learners did do well in this question at all. The only question that was well answered was questions 5.2.1 This was an unfamiliar context and learners could not familiarise themselves with it. Also learners could not work with large numbers which counted against them.

- (b) Why the question was poorly answered? Also provide specific examples, indicate common errors committed by learners in this question, and any misconceptions.

5.1.1 Learners did not understand what is meant by net migration rate. Only



migration was defined.

5.1.2 They did not understand what the term projected mean and then they could not work with the large numbers given.

5.2.1 Learners could easily find the answer by reading from the graph.

5.2.2 Learners struggled with finding the difference between production and consumption, and again the crude oil was given in million which was also not easy to work with.

Because they could not find the difference, they could not comment on it.

5.2.3 Most of the learners managed to find the answer, while others could not express themselves clearly.

5.3.1 Learners could not measure the distance between the two given choke points, neither could they use the scale for calculating the distance.

5.3.2 Learners could only manage to read the 15 million barrels from the map, but were not able to calculate the total amount of crude oil.

5.3.3 Most of the learners managed to give the economic reasons why it's not advisable to transport crude oil around the Cape of Good Hope.

(c) Provide suggestions for improvement in relation to Teaching and Learning

- Use different scenarios to teach learners how to work with large numbers.
- Teach learners what is meant by projection.
- Expose learners more to compound bar graphs using large numbers.
- Expose learners to more maps with this type of context.
- More in depth revision to be done on working with scales.
- Ample time must be allocated for revision before the examinations for more contact session with the learners especially in the fourth term.

(d) Describe any other specific observations relating to responses of learners

- They only calculated the percentage but didn't add to get the new (projected) total.
- Answers not written in millions.
- They cannot work with scales.

(e) Any other comments useful to teachers, subject advisors, teacher development etc.

- Teachers need to go back to basics especially with the working of large numbers.



- Teacher to work with Geography teachers when it comes to the maps.
- Training sessions to be provided how to prepare learners for the trial and final examinations.
- Teachers need to make use of technology in order to teach learners on different scenarios.
- Intervention workshops should take place to train teacher in depth.
- Subject advisors to be visible in all schools and especially in schools where learners perform poor.

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**NAME OF THE CHIEF MARKER:**

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**SIGNATURE**

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**DATE**

